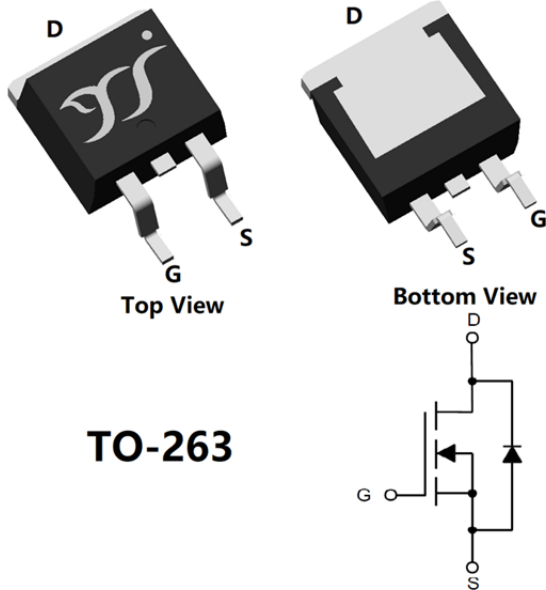


N-Channel Enhancement Mode Field Effect Transistor



Product Summary

- V_{DS} 100V
- I_D 56A
- $R_{DS(on)}$ (at $V_{GS}=10V$) $< 11m\Omega$
- $R_{DS(on)}$ (at $V_{GS}=4.5V$) $< 16m\Omega$
- 100% EAS Tested
- 100% ∇V_{DS} Tested

General Description

- Low $R_{DS(on)}$ & FOM
- Extremely low switching loss
- Excellent stability and uniformity
- Fast switching and soft recovery
- Part no. with suffix "Q" means AEC-Q101 qualified

Applications

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply
- DC-DC convertor
- 12V 24V 48V Automotive systems

■ Absolute Maximum Ratings ($T_A=25^\circ C$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	100	V
Gate-source Voltage		V_{GS}	± 20	V
Drain Current	$T_C=25^\circ C$	I_D	56	A
	$T_C=100^\circ C$		39	
	$T_A=25^\circ C$		11	
	$T_A=100^\circ C$		8	
Pulsed Drain Current ^A		I_{DM}	224	A
Avalanche energy ^B		EAS	100	mJ
Total Power Dissipation ^C	$T_C=25^\circ C$	P_D	83	W
	$T_C=100^\circ C$		41	
	$T_A=25^\circ C$		3.6	
	$T_A=100^\circ C$		1.8	
Junction and Storage Temperature Range		T_J, T_{STG}	-55~+175	$^\circ C$



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■ Thermal resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient ^D	Steady-State	$R_{\theta JA}$	35	42	°C/W
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	1.5	1.8	

■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJB011G10AQ	F1	YJB011G10A	800	/	8000	13"Reel

- A. Repetitive rating; pulse width limited by max. junction temperature.
- B. $T_J=25^{\circ}\text{C}$, $V_{DD}=40\text{V}$, $V_G=10\text{V}$, $R_G=25\Omega$, $L=0.5\text{mH}$, $I_{AS}=20\text{A}$.
- C. P_q is based on max. junction temperature, using junction-case thermal resistance.
- D. The value of $R_{\theta JA}$ is measured with the device mounted on the minimum recommend pad size, in the still air environment with $T_A=25^{\circ}\text{C}$. The maximum allowed junction temperature of 175°C . The value in any given application depends on the user's specific board design.



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■ Electrical Characteristics (T_J=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =1mA	100			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =80V, V _{GS} =0V			1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} =0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	1	1.7	3	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A		8.5	11	mΩ
		V _{GS} =4.5V, I _D =20A		11	16	mΩ
Diode Forward Voltage	V _{SD}	I _S =20A, V _{GS} =0V		0.85	1.3	V
Gate resistance	R _G	f=1MHz		1.2		Ω
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHz	-	1545	-	pF
Output Capacitance	C _{oss}		-	744	-	
Reverse Transfer Capacitance	C _{rss}		-	80	-	
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =30V, I _D =30A	-	29.8	-	nC
Gate-Source Charge	Q _{gs}		-	4.9	-	
Gate-Drain Charge	Q _{gd}		-	8.4	-	
Reverse Recovery Charge	Q _{rr}	I _F =30A, di/dt=100A/us	-	63	-	nC
Reverse Recovery Time	t _{rr}		-	45	-	ns
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DS} =30V, I _D =30A R _{GEN} =2.5Ω	-	9.8	-	ns
Turn-on Rise Time	t _r		-	42	-	
Turn-off Delay Time	t _{D(off)}		-	17.5	-	
Turn-off fall Time	t _f		-	4.2	-	



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Typical Electrical and Thermal Characteristics Diagrams

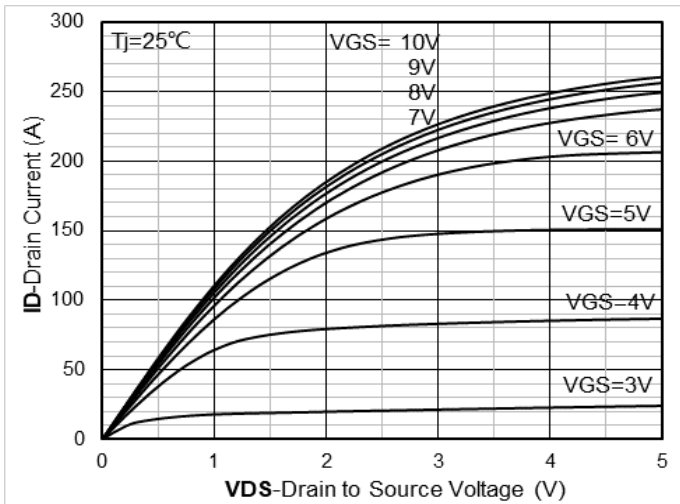


Figure 1. Output Characteristics

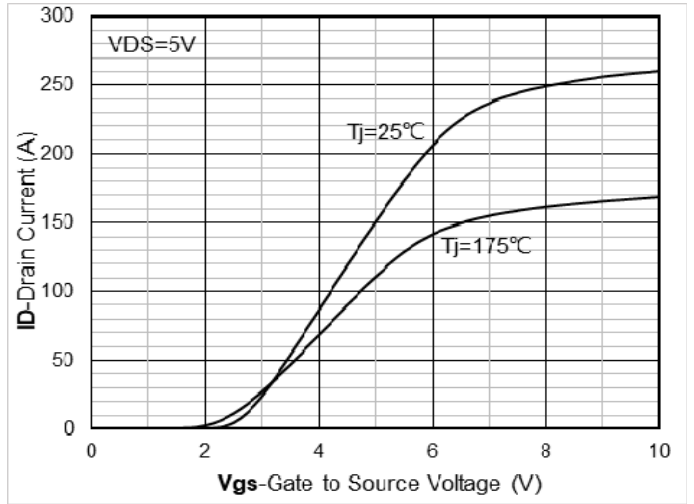
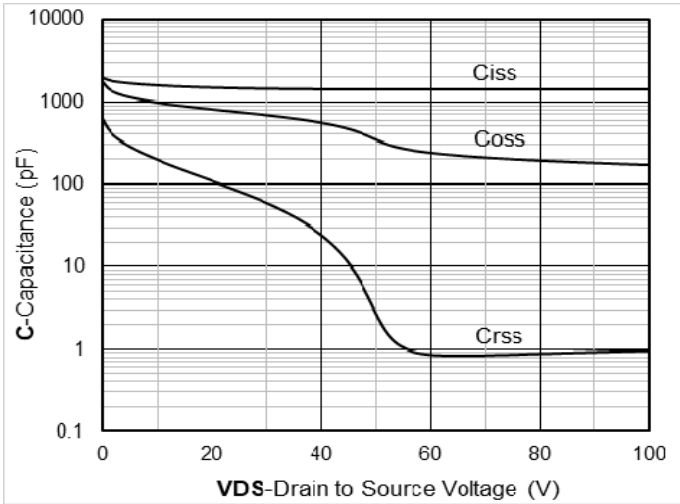


Figure 2. Transfer Characteristics



3. Capacitance Characteristics

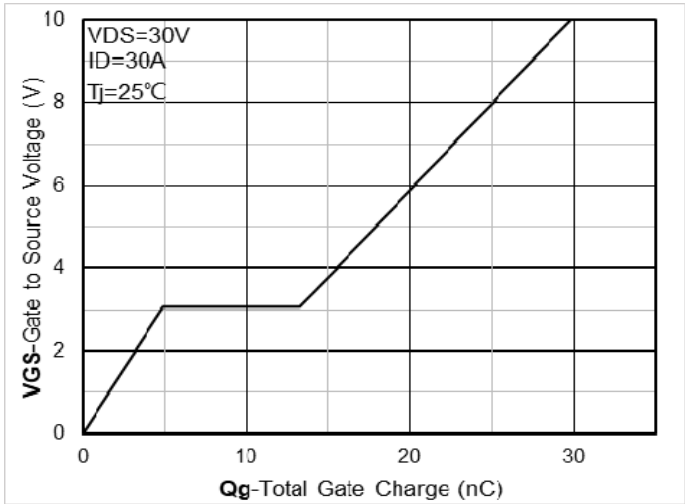


Figure 4. Gate Charge

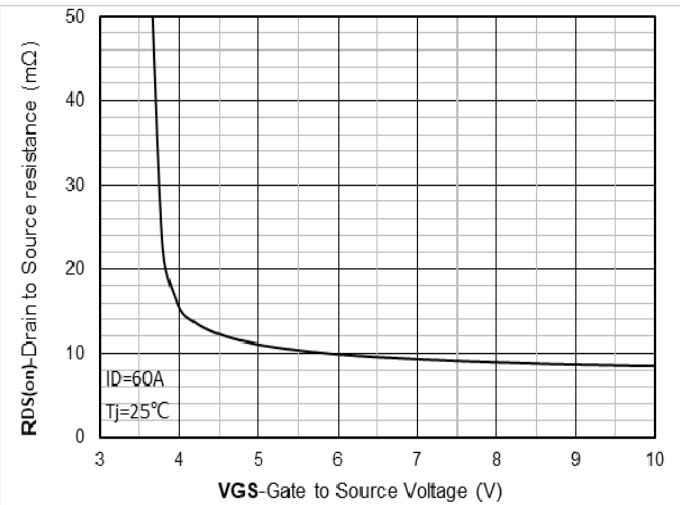


Figure 5. On-Resistance vs Gate to Source Voltage

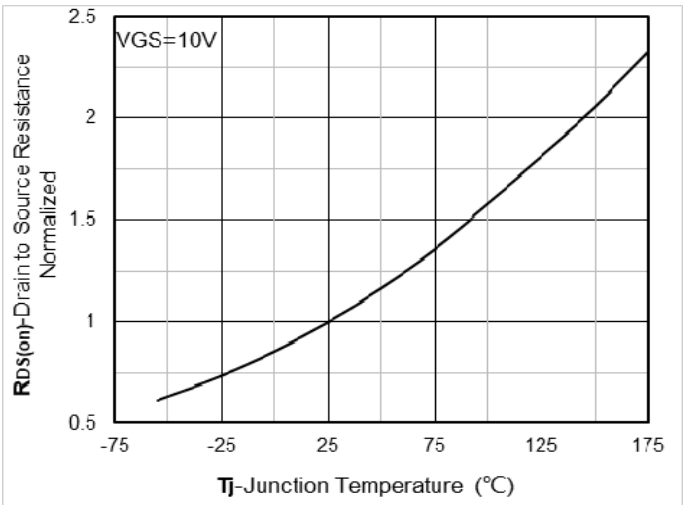


Figure 6. Normalized On-Resistance

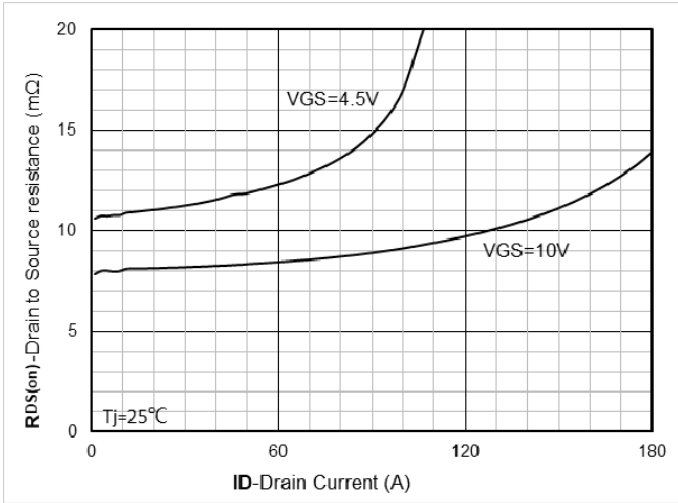


Figure 7. $R_{DS(on)}$ VS Drain Current

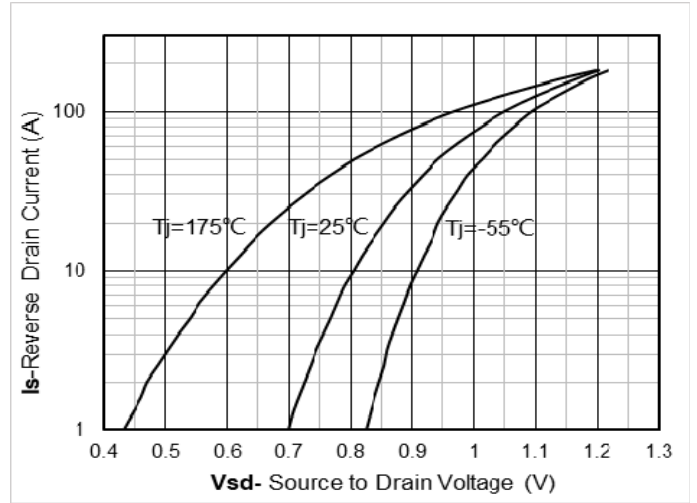


Figure 8. Forward characteristics of reverse diode

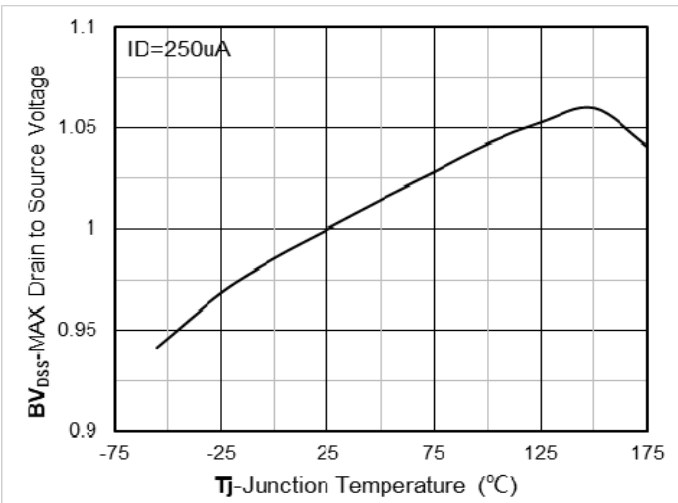


Figure 9. Normalized breakdown voltage

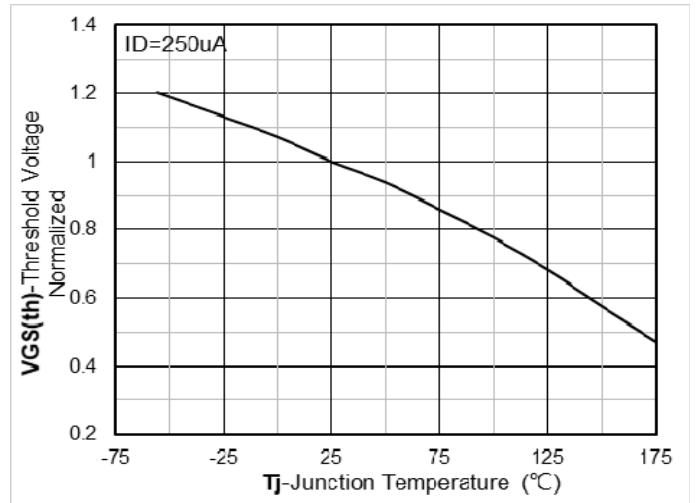


Figure 10. Normalized Threshold voltage

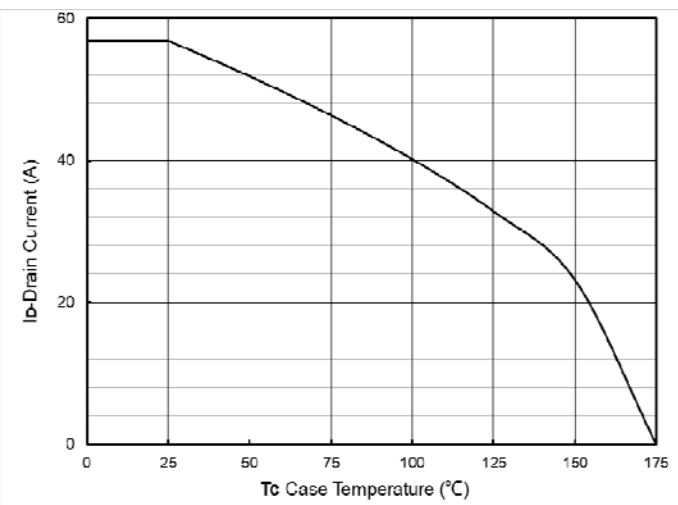


Figure 11. Current dissipation

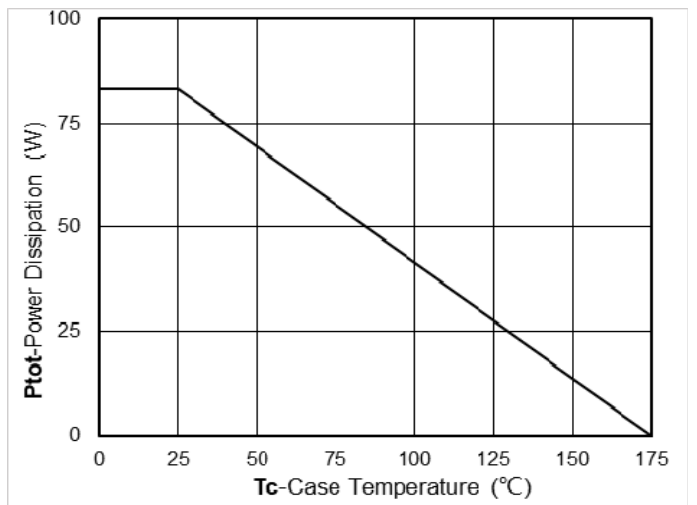


Figure 12. Power dissipation



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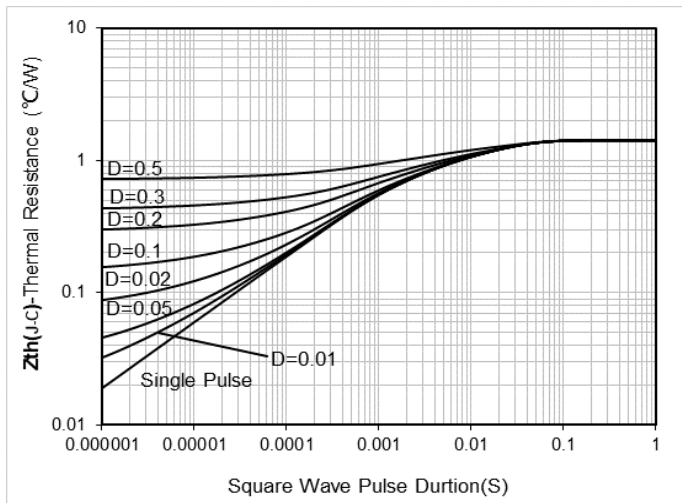


Figure 13. Maximum Transient Thermal Impedance

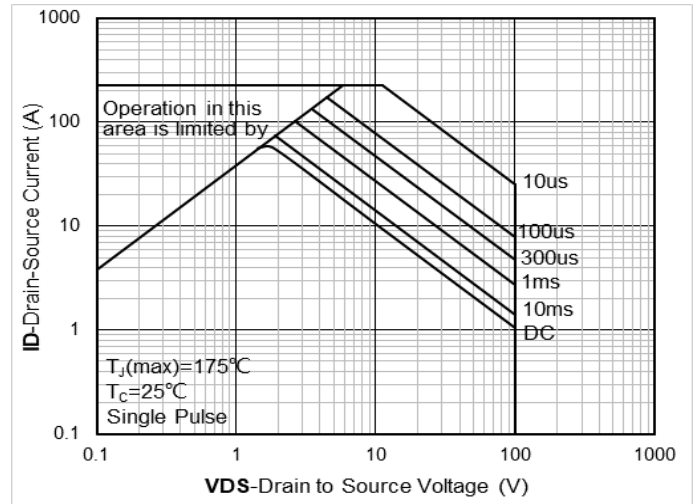
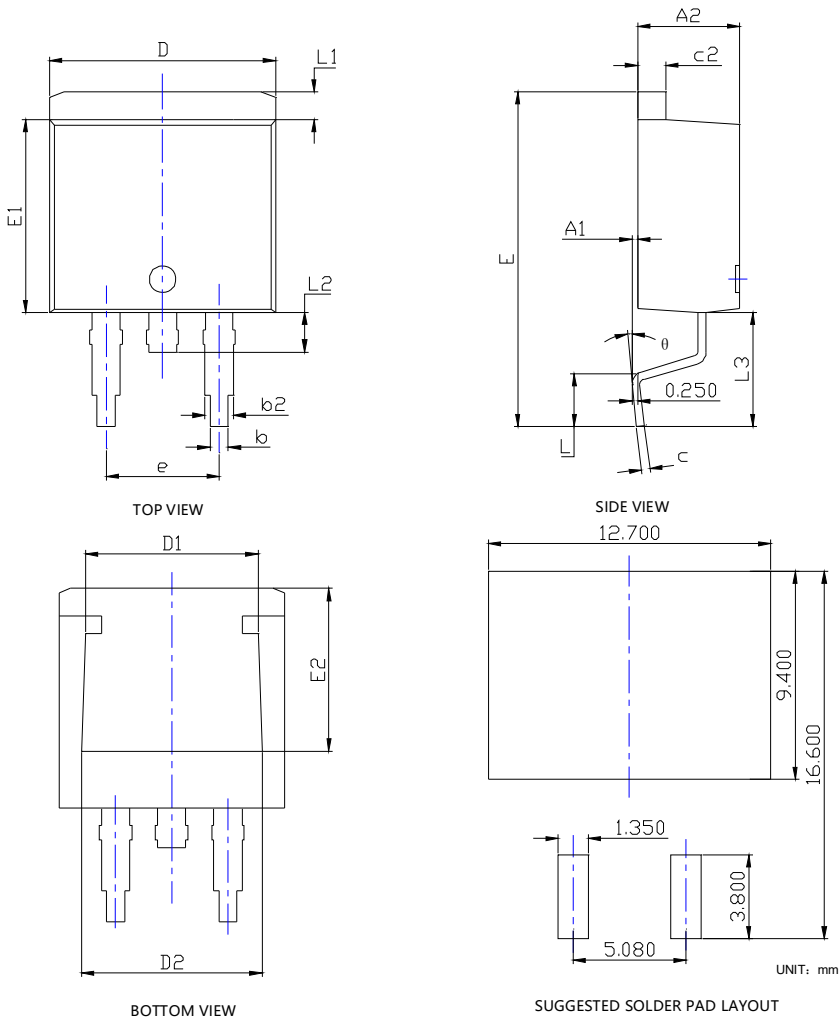


Figure 14. Safe Operation Area



YJB011G10AQ

TO-263-HY Package information



SYMBOL	DIMENSIONS					
	INCHES			Millimeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A1	0.000	---	0.010	0.000	---	0.250
A2	0.174	0.180	0.186	4.430	4.580	4.730
b	0.028	0.032	0.036	0.720	0.820	0.920
b2	0.046	0.050	0.054	1.180	1.280	1.380
c	0.013	0.015	0.018	0.330	0.390	0.450
c2	0.048	0.050	0.053	1.220	1.280	1.340
D	0.394	0.400	0.406	10.000	10.150	10.300
D1	0.295	0.307	0.319	7.500	7.800	8.100
D2	0.303	0.315	0.327	7.700	8.000	8.300
E	0.571	0.591	0.610	14.500	15.000	15.500
E1	0.337	0.341	0.348	8.550	8.700	8.850
E2	0.276	0.287	0.299	7.000	7.300	7.600
e	0.200BSC			5.080BSC		
L	0.070	---	0.110	1.790	---	2.790
L1	0.044	---	0.056	1.120	---	1.420
L2	0.030	---	0.070	0.770	---	1.770
L3	0.197REF			5.000REF		
θ	0°	---	8°	0°	---	8°

NOTE:

1. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
2. TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
3. THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.



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